

# NATIONAL BUREAU OF STANDARDS REPORT

## NBS PROJECT

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Development, Testing, and Evaluation of  
Visual Landing Aids

Consolidated Progress Report

to the  
Airborne Equipment Division  
Bureau of Aeronautics  
Department of the Navy

for the period  
October 1 to December 31, 1953

for  
Bureau of Aeronautics Projects

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# Development, Testing, and Evaluation of Visual Landing Aids

Quarter Ending December 31, 1953

## Miscellaneous Testing and Consultation

The report on the portable taxi light has been completed and transmitted to the Airborne Equipment Division.

The definitions of the identification colors and those used in the specifications for signal lights for marine and land transportation are being studied in relation to the chromaticity characteristics of the filters used to represent them to find ways of making these definitions consistent with those for aviation colors without adversely affecting the practices of the services involved. The revision of Part 1 is complete except for the equations required for defining the identification colors.

## Kinorama Research

The adjustment of the kinorama is now considered satisfactory for the validation program. At the close of the last quarter the rate instruments and the chart drive of the recorder were still presenting problems. The chart drive has been improved so that the chart stays in synchronism with the configuration belt at normal landing speeds. Such irregularities as remain can be corrected at intervals between tests. The rate meter chassis has been completed and installed. All meters have been adjusted, calibrated and provided with temporary dials. The photoelectric relay circuit, which controls the presetting of the forward motion, the synchronizing of the forward position indicator and recorder for each approach, and the recording of forward progress on the chart, has been improved by better shielding. This has made it possible to relocate the photocell chassis and place it on the relay rack.

False cues have been largely eliminated thru the addition of background illumination with blue light to give all the surfaces within the pilot's view the same brightness. To insure that the pilot does not cut off his own view thru bad eye alignment, the shutter has been replaced by a diffusing filter and low intensity red floodlighting introduced in the area beyond it during the interval between approaches. This provides the pilot with a view of the cockpit cut-off silhouetted against a dim red background that does not interfere with his dark adaptation. Trial runs are now being made by the technical staff and these have lead to some improvements in controller procedures. The technique of making the simulated lights, especially the bar-lights, has been improved. The new method saves time and gives an improved model. Three chassis to replace the temporary wiring in the control table are in the design stage.



The necessity for establishing some criterion for adequate training in the use of the kinorama pointed to the desirability of using for training purposes a configuration with which there has been considerable experience in order that the performance achieved in simulated landings may be compared with a known performance in actual landings. The two-row system that has been extensively used since its installation on many airfields during the last war, appears to be the best known system. A training and qualifying program has been designed around this system and after discussion with Prof. Hackman, who has been acting as psychological consultant for the project, it has been adopted for the exploratory tests.

A report describing the kinorama and outlining the problems involved in validating and using it has been presented to the Armed Forces, National Research Council, Vision Committee. The interest of the Vision Committee in the kinorama testing appears particularly desirable since this committee contains most of the experts who are concerned with the optical and psychological problems of vision encountered in the armed services.

It appears likely that the most serious problem to be encountered during the coming quarter is that of obtaining a sufficiently large group of subjects for operating the kinorama in view of the limited funds available and anticipated for the present fiscal year.

